

Claims

What is claimed is:

- 1 1. A building panel, comprising:
  - 2 (a) a curved central portion;
  - 3 (b) a pair of side wall portions extending from
  - 4 opposite ends of said curved central portion; and
  - 5 (c) a pair of complementary wing portions extending
  - 6 from said side wall portions.
- 1 2. The building panel of Claim 1, wherein said curved
- 2 central portion has a concave shape from a perspective
- 3 between said side wall portions.
- 1 3. The building panel of Claim 1, wherein said curved
- 2 central portion resembles an arc.
- 1 4. The building panel of Claim 3, wherein said arc ranges
- 2 from 15° to 130°.
- 1 5. The building panel of Claim 3, wherein said arc ranges
- 2 from 40° to 130°.

1    6. The building panel of Claim 5, wherein said arc ranges  
2    from 60° to 120°.

1    7. The building panel of Claim 6, wherein said arc is 85°.

1    8. The building panel of Claim 3, wherein said arc has a  
2    radius ranging from 4 inches to 25 inches.

1    9. The building panel of Claim 3, wherein said arc has a  
2    radius ranging from 4 inches to 12 inches.

1    10. The building panel of Claim 9, wherein said radius  
2    ranges from 5 inches to 8 inches.

1    11. The building panel of Claim 9, wherein said radius is  
2    6 inches.

1    12. The building panel of Claim 1, wherein said side wall  
2    portions extend at an incline from opposite ends of said  
3    curved central portion.

1       **13.** The building panel of Claim 1, wherein said side wall  
2        portions extend tangentially from opposite ends of said  
3        curved central portion.

1       **14.** The building panel of Claim 1, wherein one of said  
2        wing portions comprises a hook portion and the other of  
3        said wing portions comprises a hem portion.

1       **15.** A building structure, comprising a plurality of  
2        interconnected panels, each of said panels comprising:

3               (a) a curved central portion;

4               (b) a pair of side wall portions extending from  
5        opposite ends of said curved central portion; and

6               (c) a pair of wing portions extending from said side  
7        wall portions, wherein one wing portion extends from a  
8        first of said side wall portions and the other wing  
9        portion extends from a second of said side wall  
10      portions, wherein said one wing portion from a first  
11      of said panels is connected to said other wing portion  
12      from a second of said panels.

1   **16.** The building structure of Claim 15, wherein said  
2   curved central portion has a concave shape from a  
3   perspective between said side wall portions.

1   **17.** The building structure of Claim 15, wherein said  
2   curved central portion resembles an arc.

1   **18.** The building structure of Claim 17, wherein said arc  
2   ranges from 15° to 130°.

1   **19.** The building panel of Claim 17, wherein said arc has a  
2   radius ranging from 4 inches to 25 inches.

1   **20.** The building structure of Claim 15, wherein said one  
2   wing portion comprises a hook portion and said other wing  
3   portion comprises a complementary hem portion such that  
4   said hook and hem portions interconnect.

1 21. A panel crimping machine for crimping a panel having a  
2 curved central portion, comprising:

3 (a) a pair of crimping rollers offset from one  
4 another and located within said panel crimping machine  
5 such that when a panel enters said panel crimping  
6 machine the curved central portion of the panel passes  
7 between said crimping rollers, said pair of crimping  
8 rollers comprising:

9 (i) a male crimping roller comprising

10 (A) a hub, and

11 (B) a plurality of male crimping blades  
12 extending radially from said hub, each of  
13 said male crimping blades having a concave  
14 profile, and

15 (ii) a female crimping roller comprising

16 (A) a hub, and

17 (B) a plurality of female crimping blades  
18 extending radially from said hub, each of  
19 said female crimping blades having a convex  
20 profile complimentary to said concave  
21 profile of said male crimping blades; and

22 (b) means for driving said pair of crimping rollers  
23 such that said crimping rollers rotate, thereby  
24 causing said male crimping blades and said female

25        crimping blades to alternately intersect and crimp the  
26        curved central portion of the panel.

1        22. The panel crimping machine of Claim 21, wherein said  
2        means for driving said pair of crimping rollers includes a  
3        motor and a mechanical drive train that connects said motor  
4        to said crimping rollers.

1        23. The panel crimping machine of Claim 22, wherein said  
2        mechanical drive train drives one of said crimping rollers  
3        and allows the other of said crimping rollers to idle.

1        24. The panel crimping machine of Claim 22, wherein said  
2        mechanical drive train drives both of said crimping  
3        rollers.

1   **25.** The panel crimping machine of Claim 21, wherein said  
2   drive trains comprises:

3           (a) a first shaft extending through said male  
4           crimping roller;

5           (b) a second shaft extending through said female  
6           crimping roller;

7           (c) a first gear mounted on said first shaft;

8           (d) a second gear mounted on said second shaft, said  
9           second gear engaging said first gear;

10          (e) an idler sprocket engaging said second sprocket;  
11          and

12          (f) a motor connected to and driving said idler gear,  
13          which in turn rotates said first and second gears,  
14          thereby rotating said male and female crimping  
15          rollers.

1   **26.** The panel crimping machine of Claim 25, further  
2   comprising a clutch located between said motor and said  
3   idler sprocket.

1   **27.** The panel crimping machine of Claim 26, wherein said  
2   clutch is a reversing clutch.